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ABSTRACT

The paper briefly discusses pedagogical theory underlying the application of cooperative learning strategies in postsecondary environments and describes specific cooperative pedagogical strategies. Most of the paper consists of descriptions of the following exemplary cooperative learning techniques, with supporting data when available: (1) Aronson's Jigsaw Classroom (in which material to be learned is apportioned among student groups who teach their expertise to the rest); (2) Dansereau's scripted dyadic model, in which pairs of students exchange multiple oral summaries of brief sections of text material; (3) Fantuzzo's reciprocal peer tutoring (pairs of students test each other in preparation for a class test); (4) Johnson, Johnson, and Smith's structured controversy (students are assigned to support opposing sides of an issue); (5) Lyman's Think-Pair-Share technique (pairs of students discuss individual responses and then share with the whole group); (6) Miller and Spencer's roundtable (students brainstorm their responses); (7) Sharan's group investigation model (small groups investigate and prepare presentations on a subtopic); (8) Sherman and Woy-Hazleton's student team project (student groups work on a real community problem); and (9) Sherman's dyadic essay confrontations (students compose and share sample essay questions). Approximately 100 references accompany the theoretical portion of the paper, and an appendix includes an annotated bibliography of 58 items. (DB)

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# COOPERATIVE LEARNING IN POST SECONDARY EDUCATION: IMPLICATIONS FROM SOCIAL PSYCHOLOGY FOR ACTIVE LEARNING EXPERIENCES.

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**A presentation to the annual meetings of the American Educational Research Association**, Division J, Chicago, IL, Appril 3-7, 1991.

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COOPERATIVE LEARNING IN POST SECONDARY EDUCATION:
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Kurt Lewin, one important founding father of social psychology, influenced the development of the **Group Dynamics** movement in the early 1940's. Several of his students have continued that tradition. The generations of Lewinian influence are detailed in **Figure 1.** One of his students, Morton Deutsch, has had a long and continuing interest in "applied" social psychology. His research interests have ranged from studying productivity of work groups experiencing cooperative or competitive conditions, to more recent attempts at resolving the nuclear arms race/conflict. Throughout the past 15 years renewed interest in Deutsch's (1949) earlier research has lead several scholars to re-examine the influence of cooperation and competition on instruction. Other students of Kurt Lewin have also had a strong interest in group dynamics concepts and their applications in educational settings (eg., Leon Festinger, Ronald Lippitt and Jacob Kounin). Lewin's heritage continues on through third generation students of students of Lewin (eg., David Johnson, a student of Morton Deutsch; Eliot Aronson, a student of Leon Festinger; Richard Schmuck, a student of Ronald Lippitt; and myself, a student of Jacob Kounin).

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PUT FIGURE 1 HERE

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Almost all Lewinian-oriented psychologists subscribe to the theory that human behavior is a result of the interaction of persons with their environments. This has lead to many speculations on **"ACTION THEORY."** An action theory examines the actions needed to achieve a desired consequence in a given situation. Johnson & Johnson (1987) have stated that "when you generate an action theory from your own experiences and then continually modify it to improve its effectiveness, you are learning experientially (p. 16-17) (See **Figure 2**). Experiential learning affects the learner in three ways: 1) cognitive structures are altered, 2) attitudes are modified and 3) behavioral skills are expanded. This is thought to be a cyclical process. The Johnsons (1987) have presented 12 principles of experiential learning (See **Twelve Lewinian Principles of Experiential Learning, Figure 3**). The last four principles focus on the influence of environments on individuals, especially the context of a social group on experiential learning. Membership in a group which is supportive and accepting will free a person to experiment with new behaviors, attitudes, and action theories. One such group might be a cooperative classroom structured for learning.

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PUT FIGURE 2 & 3 HERE

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The purpose of this paper is to present some examples of cooperative pedagogical strategies which are presently being used in post-secondary environments, especially in the context of teaching psychology. One of the first issues which needs to be addressed is the differentiation between three types of teaching formats which the Johnsons (1979) describe as **goal structures**. The three goal structures are 1) cooperative, 2) individually competitive, and 3) individualistic. These goal structures are primarily based on the notion of the presence or absence of interdependence among classroom members. Three types of **positive interdependence** have been described by Thompson (1967) and include 1) pooled, 2) sequential, and 3) reciprocal interdependence. If any three are present we can assume a cooperative goal structure is in operation. One form of cooperative learning has been labeled **"Collaborative Learning"** and has been used extensively in the teaching of writing at the post-secondary level of education. While elements of collaborative learning are present in many cooperative pedagogics, some have felt it necessary to make a distinction between collaborative and cooperative learning.

Cooperative goal structures are in operation when two or more individuals are in a situation where the task-related efforts of individuals help others to be rewarded. Group members behave in a positively interdependent fashion and are rewarded on the basis of the quality or quantity of the group product according to a fixed set of standards, those standards being mastery or

criterion-referenced performance standards. Collaborative learning might fit into this category of goal structure. A variety of **Peer-tutoring** models such as Aronson's Jigsaw technique, Fantuzzo's or Dansereau's peer dyads would also be located here. The Johnsons' and Sharans' Group-Investigation models are considered cooperative goal structures. Sherman's (1990) Dyadic Essay Confrontations (DEC) might be considered an example of a cooperative technique which makes use collaborative learning. Slavin (1983) has further differentiated cooperative goal structures on the basis of two types of task structures and three types of incentive structures (See **Figure 4**).

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Individually competitive goal structures give students individual goals and reward them by means of a comparative or normative evaluation system. In an individually competitive structure a student can attain his or her goal only if the other participants cannot attain their goals: in other words, one achieves their goal at the expense of others. Kohn (1986) has described this as **MEGA** (**M**utually **E**xclusive **G**oal **A**ttainment). In this sense though there is some interdependence among students, it is primarily **negative interdependence**. One may achieve their goal at the expense of others. Cheating and "dirty tricks" are the usual examples of negative interdependence. Some have described this as the "traditional" structure (Wolff, 1969).

An individualistic goal structure is one in which students are given individual goals, and by using a criterion-referenced evaluation system students are assigned individual rewards. Whereas student interdependence is required in the cooperative structure, students behave quite independent of each other in an individualistic structure. Individualistic structures usually use a criterion-referenced evaluation system.

Obviously there is a relationship between goal structures and the methods of evaluation which are used. Some have described evaluation as being either norm-referenced or criterion-referenced (Bloom, Hastings & Madaus, 1971). Individually competitive goal structures logically demand a norm-referenced form of evaluation. Likewise, cooperative goal structures demand a criterion-referenced system of evaluation.

While earlier interest in cooperative pedagogy is acknowledged (eg., Hains & McKeachie, 1967), Kohn's (1986) recent book presents the strongest arguments in favor of teaching through cooperation. Throughout the 1970's and 1980's social and educational psychologists such as the Johnsons (Johnson & Johnson, 1975; Johnson & Johnson, 1987), Eliot Aronson (Aronson et al., 1975; Lucker, et al., 1976; Blaney et al., 1977; Aronson, 1978), Robert Slavin (1978a; 1978b; 1983) and the Sharans (Sharan, 1980; Sharan, et al., 1985) have produced a considerable volume of research demonstrating the effectiveness of a great variety of small group cooperative pedagogical strategies, especially at the elementary and secondary education level. There now exists a

professional organization devoted entirely to the study of cooperative learning (**International Association for the Study of Cooperation in Education**). Nevertheless, little research has been accomplished in the college or university environment where the mode of instruction remains, many believe, as individually competitive as Wolff's (1969) earlier descriptions. A few examples of recent uses of cooperation in university settings might be Carroll's (1986) study using Aronson's "Jigsaw" technique in undergraduate psychology classrooms, or Lamberights' (1988) report of successful implementation of Jigsaw techniques in a similar setting. Sherman (1986, 1988) and Gnagey (1988) have described the use of Slavin's **Student Teams and Achievement Divisions (STAD)** technique as well as Sharan's **Group-Investigation (G-I) Model** in undergraduate educational psychology classes. In the past five years several new articles have analyzed the uses of cooperative learning in a variety of post-secondary educational settings (Dansereau, 1985; Dansereau et al, 1986; Fantuzzo et al, 1989; Millis, 1990).

Most social psychology text books contain considerable discussions about conflict, sometimes instigated by individual or inter-group competition, and its resolution and/or reduction through the use of cooperative techniques. Social Psychologists' interests in intergroup relations are beginning to acknowledge the applications and effectiveness of cooperative learning (eg., see Messick & Mackie, 1989). Almost all introductory educational psychology text books (eg. Dembo, 1991; Good & Brophy, 1990;

Slavin, 1991; Glover & Bruning, 1990) now contain extended discussions of cooperative pedagogics and their effectiveness with regard to improved racial relations, self-esteem, internal locus of control and academic achievement. It is ironic that cooperative pedagogics have not been more greatly exploited in the teaching of psychology, especially social psychology, the discipline from which these various cooperative pedagogics originated. It also seems ironic that more research on small groups has not come from the discipline of psychology and also included greater analysis of human behavior under the conditions of a cooperative pedagogical treatment (Levine & Moreland, 1990, p. 620).

Thus, while there appears to be considerable evidence supporting the effectiveness, as well as need, for cooperative learning applications in post-secondary settings, much more needs to be accomplished. The remainder of this presentation is a series of brief descriptions of cooperative pedagogical strategies which are presently being used in the teaching of psychology at both the undergraduate and graduate levels of post-secondary instruction. They include:

Aronson's "Jigsaw" model

Dansereau's "Scripted Dyadic" model

Fantuzzo's "Reciprocal Peer Tutoring" model

The Johnsons' "Academic Conflict" model

Sharan's "Group Investigation" model

Sherman's "Dyadic essay confrontation" model

Each method is briefly described in **Appendix A.** Also, an annotated bibliography of source materials is included in **Appendix B.** For instructors who are interested in getting more cooperatively involved with other teachers who are using these techniques, I have also supplied an application blank for membership in the **International Association for the Study of Cooperation in Education (IASCE).** Other sources of information on cooperative learning in post-secondary educational settings are available from Jim Cooper at the following address:

Center for Quality Education,

California State University Dominguez Hills,

HFA-B-316

1000 East Victoria Street,

Carson, CA 90747.

Dr. Cooper is establishing a network/newsletter for interested instructors. An application blank has been supplied and if you send it to Jim at the above address, he will put you in touch with the network. The first volume of this newsletter, December, 1990 has recently been distributed as "Cooperative Learning and College Teaching."

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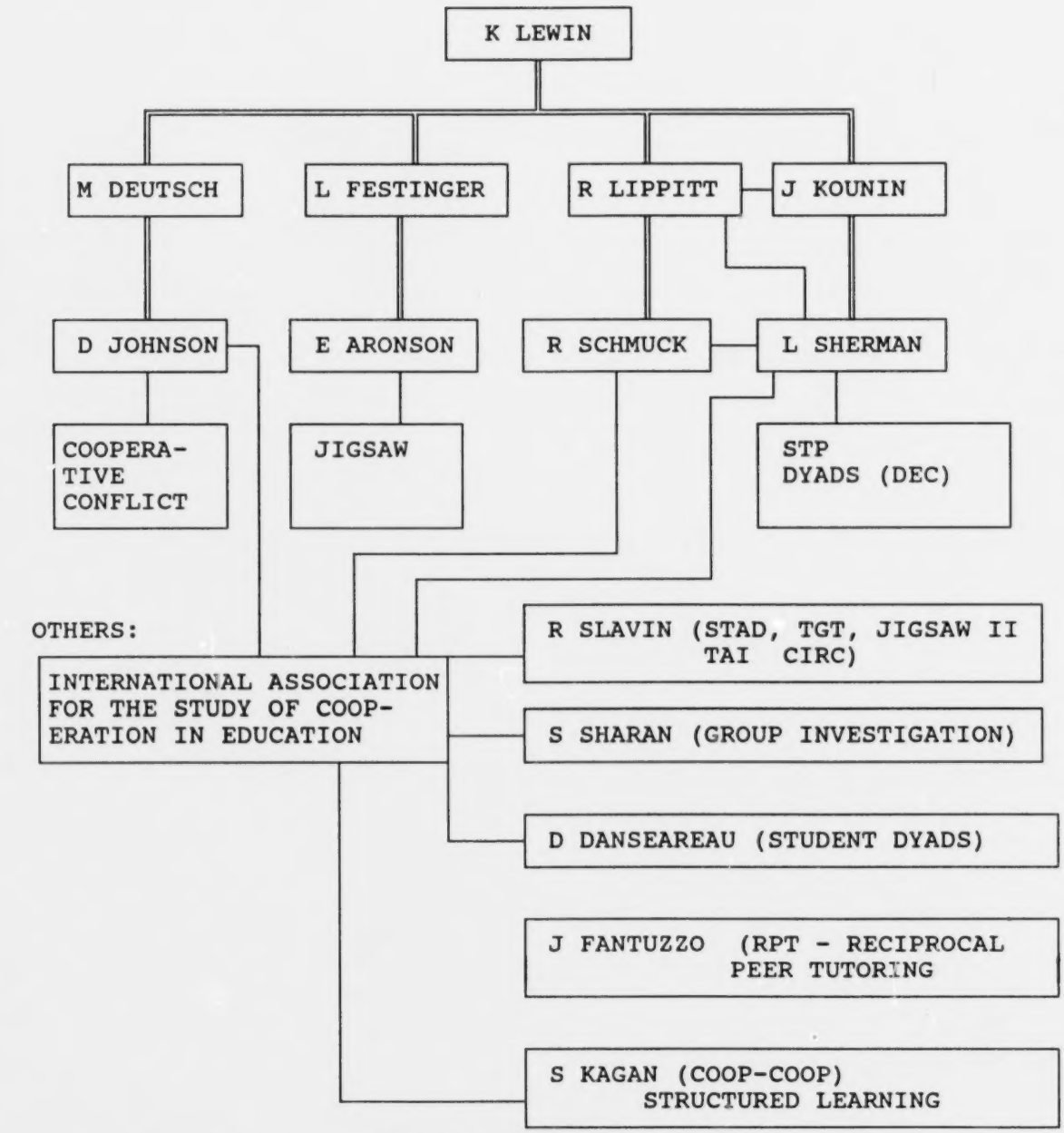
Whipple, W. (1987). Collaborative learning: Recognizing it when we see it. **American Association for Higher Education, 40**(2), 3-7.

Wolff, R. P. (1969). **The ideal of the university.** Boston: Beacon.

**Figure 1**
**GENERATIONS OF LEWIN**

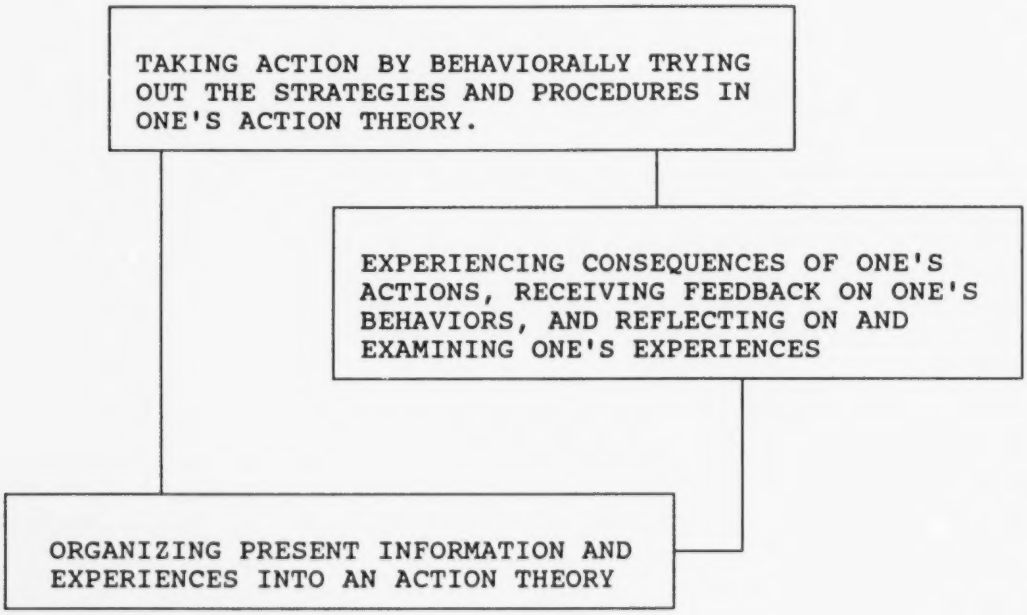



= **DIRECT INFLUENCE**

= **INDIRECT INFLUENCE**

**Figure 2**
**EXPERIENTIAL LEARNING CYCLE**

(After Johnson & Johnson, 1987, p. 18.)




"AN **ACTION THEORY** IS A THEORY AS TO WHAT ACTIONS ARE NEEDED TO ACHIEVE A DESIRED CONSEQUENCE IN A GIVEN SITUATION (pp. 16).

"WHEN YOU GENERATE AN ACTION THEORY FROM YOUR OWN EXPERIENCES AND THEN CONTINUALLY MODIFY IT TO IMPROVE ITS EFFECTIVENESS, YOU ARE LEARNING EXPERIENTIALLY (p. 16-17).

EXPERIENTIAL LEARNING AFFECTS THE LEARNER IN THREE WAYS:

1) COGNITIVE STRUCTURES ARE ALTERED,
2) ATTITUDES ARE MODIFIED AND
3) BEHAVIORAL SKILLS ARE EXPANDED.

**Figure 3**
TWELVE LEWINIAN PRINCIPLES OF EXPERIENTIAL LEARNING.

(After Johnson & Johson, 1987, p. 18-20)

**Principle 1.** Effective experiential learning will affect the learner's cognitive structures (action theories), attitudes and values, perceptions and behavioral patterns.

**Principle 2.** People will believe more in knowledge they have discovered themselves than in knowledge presented by others.

**Principle 3.** Learning is more effective when it is an active rather than a passive process.

**Principle 4.** Acceptance of new action theories, attitudes, and behavioral patterns cannot be brought about by a piecemeal approach - one's whole cognitive-affective-behavioral system has to change.

**Principle 5.** It takes more than information to change action theories, attitudes, and behavioral patterns.

**Principle 6.** It takes more than firsthand experience to generate valid knowledge. Besides experience, there needs to be a theoretical system that the experience tests out, and reflection on the meaning of the experience.

**Principle 7.** Behavior changes will be temporary unless the action theories and attitudes underlying them are changed.

**Principle 8.** Changes in perceptions of oneself and one's social environment are necessary before changes in action theories, attitudes, and behavior will take place.

**Principle 9.** The more supportive, accepting, and caring the social environment, the freer a person is to experiment with new behaviors, attitudes, and action theories.

**Principle 10.** In order for changes in behavior patterns, attitudes and action theories to be permanent, both the person and the social environment have to change.

**Principle 11.** It is easier to change a person's action theories, attitudes, and behavioral patterns in a group context than in an individual context.

**Principle 12.** A person accepts a new system of action theories, attitudes, and behvioaral patterns when he or she accepts membership in a new group.

Figure 4

**Categorization of Cooperative Learning Methods by Incentive and Task Structures**

| | Incentive Structure | | |
|---|---|---|---|
| **Task Structure** | **Group Reward for Individual Learning** | **Group Reward for Group Product** | **Individual Reward** |
| **Group Study (No task specialization** | STAD, TGT, Humphreys, et al, (1982) methods Hamblin, et al, (1971) methods Sherman (1986) | Learning Together, Wheeler & Ryan (1973) methods | Peterson & Janicki (1979) Webb & Kenderski, (1984) Starr & Schuermann, (1974) Sherman (1986) |
| **Task specialization** | Jigsaw II | Group investigation Sharan (1980) Sherman & Hazleton, (1988). Sherman (1988) | Aronson's (1978) Jigsaw. |

## APPENDIX A

## DESCRIPTIONS OF EXAMPLARY TECHNIQUES AND METHODS

ARONSON: JIGSAW ..... 23

DANSEREAU: DYADIC LEARNING GROUPS..... 24

FANTUZZO: RECIPROCAL PEER TUTORING..... 27

JOHNSON'S: ACADEMIC CONFLICT MODEL..... 28

LYMAN'S THINK-PAIR-SHARE ..... 29

MILLER & SPENCERS ROUNDTABLE ..... 30

SHARAN: GROUP INVESTIGATION..... 31

SHERMAN: STUDENT TEAM PROJECTS ..... 32

DYADIC ESSAY CONFRONTATIONS..... 33

**THE JIGSAW CLASSROOM [Aronson and associates, 1978).** "The jigsaw classroom is not a loose, 'anything goes' situation. It is highly structured. Interdependence is required. It is the element of "required" interdependence among students which makes this a unique learning method, and it is this interdependence that encourages the students to take an active part in their learning." (Aronson et al, 1978, p. 28). Text material is divided into discrete chunks of information. The number of "chunks" is equal to the size of the groups which are used, approximately 4 to 6 member groups. Each group member becomes an expert on their chunk of information by studying that information with members of other groups who are supposed to be learning the same chunk of information. Then the experts go back to their home groups and are responsible for making sure the other members of their group know their expert information. At the end of the unit of study, the students are tested over the information which they should have learned.

Variations on this structure have been contributed by many teachers. David Carroll's (1986) study is an example used in undergraduate psychology classrooms. Robert Slavin (1986) has used a version entitled **Jigsaw II** in which a handicapping scheme is applied to students of differing abilities. Sometimes bonus points are given to groups who perform better than others, (cooperation with inter-group competition.)

Aronson, E., Blaney, N., Sikes, J., Stephan, G., & Snapp, M. (1978). **The Jigsaw Classroom.** Beverly Hills, CA: Sage Publication.

**SCRIPTED COOPERATIVE DYADS (SCD) [Dansereau and associates].** This highly structured cooperative technique requires pair partners to exchange multiple oral summaries of 1 to 2 pages of text material. Partners are trained by example and practice to elaborate on each other's summaries. With regard to metacognitive abilities, partners are taught to detect and correct errors and omissions and to judge the importance of the ideas presented. This involves creating images, making analogies, and personalizing the information to make it more understandable and memorable. A typical set of instructions follows (from Larson & Dansereau, 1986):

> **INTRODUCTION.** Two heads are better than one for learning complex textbook material. In this strategy, both you and your partner study approximately 2 pages of textbook (if one finishes first s/he should go back over the material until the other one finishes.) Then, one of you (called the **"recaller"**) helps correct, amplify, and memorize the summarized material to the other (called the **"listener"**). After this is done, you both read the next 2 pages and the process is repeated with the 2 of you switching roles (ie., the **recaller** on the previous summary becomes the **listener** on the next one, and vice versa. **Roles should be switched for each summary.** This process is repeated until the entire chapter or unit has been completely studied. Your goal is to help each other maximize the learning of the material.
>
> **DETAILS ON THE TECHNIQUE:** Study 2 pages using your normal methods (feel free to take notes). The one who finishes first should review the 2 pages until the other person is finished. Then do the following:
>
> 1. The recaller puts the material out of sight while the listener keeps the passage available.
>
> 2. The **recaller** summarizes out loud what has been read as completely as possible **without looking at notes or the passage.** Do the summary as rapidly as you can. Try to include all the important ideas and facts. Use note paper to draw or chart information while making the summary. The more you can represent the ideas visually to your partner the better. Put the whole summary in your own words, not the author's. (if necessary, the **listener** should interrupt the **recaller** to make important corrections).
>
> 3. After the **recaller** has completed the summary, the **listener** should do the following while looking at the passage.

a. to improve your and your partner's understanding, correct your partner's summary by discussing any important information left out and indicating ideas or facts that were summarized incorrectly. Use **drawings** and **images** (mental pictures) whenever possible.

b. help both of you remember the material better by coming up with **clever** ways to amplify and memorize the important ideas or facts. One way is to relate the information to earlier material in the chapter and to other things you know. You also can use **drawings** and **mental pictures** to aid memory.

4. The **recaller** should help the listener correct, amplify, and memorize the summary.

5. If you complete the chapter early, go back over it using the same approach.

This entire process should be **active** and **intense**. Debates and arguments should be resolved as quickly as possible. It is very important to keep the process moving along and still do good summaries. Don't get sidetracked by trivia and irrelevancies. Remember, you should switch **recaller** and **listener** roles for each summary. (Flip a coin to determine who should be the first recaller). After you and your partner have completed studying for the day, it is important for you to discuss what strategies and skills you have learned from each other and how you can improve your cooperative interaction in the future.

The above directions are those used in a cooperative **learning** situation. A "Cooperative learning script" which is often supplied to both members of the dyad is as follows:

1. Flip a coin to detrmine who will be partner A or B.

2. Both partners read Passage #1.

3. When both are finished, put the passage out of sight.

4. Partner A orally summarizes Passage #1.

5. Partner B detects and corrects any errors in Partner A's summary (the **metacognition** step).

6. Both partners work together to develop analogies, images, etc., to help make the summarized information memorable (the **elaboration** step).

7. Both partners read Passage #2.

8. Repeat steps 4-6 with partners reversing roles.

Another version of this technique involves partners **teaching** each other materials which they have read. A typical "Cooperative **teaching** script" would be as follows:

1. Flip a coin to dermine who will be partner A or B.

2. Partner A reads Passage #1 & partner B Passage #2.

3. When both are finished, put the passages out of sight.

4. Partner A orally summarizes (teaches) the contents of Passage #1 to partner B.

5. Partner B asks clarifying questions (**metacognition** step).

6. Partners work together to develop analogies, images, etc., to help make Passage #1 information memorable (**elaboration** step).

7. Repeat steps 4-6 for Passage #2 with partners reversing roles.

8. Both partners read the passage that they did not read originally.

Among undergraduate general psychology students, these techniques were found to significantly influence cooperative learning, especially with regard to the metacognitive activities which helps achievement performance of the **listener**. The **elaborative** activities also facilitate transfer of learning to other material and situations. It is suggested that:

1. if possible, students should be paired with partners whose level of verbal ability differs from their own.
2. the cooperative teaching script should be used if mastery of content is desired.
3. the cooperative learning script with its emphasis on the elaboration step, should be used if transfer to individual reading and studying is the goal.
4. Students should be encouraged to tailor the scripts to their own needs in developing individual study plans.
5. transfer from the cooperative experience can be facilitated by switching partners and analyzing videotapes.

Dansereau, D. F. (1986b). **Dyadic and cooperative learning and performance strategies.** Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

**RECIPROCAL PEER TUTORING (RPT) [Fantuzzo and associates].** This strategy is designed to promote mutual tutoring. The **RPT** procedure requires participants to assume both tutor and student roles. Students are randomly paired with a partner throughout a semester course of study. Before every class unit exam, each partner creates a 10-question multiple-choice test based on assigned readings and lecture material for that unit. They also provide a 3 x 5 index card for each question. The card contains the correct answer to the question and a reference to the section of the book or lecture where the information was presented. For the tutoring sessions, students administer their written exams to one another under test-like conditions. After completing the exam, subjects switch tests and score their partner's exam. Then they alternately provide one another with explanations for questions answered incorrectly. Students turn in their corrected tests and answer cards before every course unit exam. The **RPT** technique has been found to have higher posttest exam scores than two comparative conditions, and it also significantly reduces distress and increases student satisfaction in undergraduate Abnormal Psychology classes (Fantuzzo, Dimeff, Fox, 1989; Fantuzzo, Riggio, Connelly, Dimeff, 1989).

Fantuzzo, J. W., Dimeff, L. A., & Fox, S. L. (1989). Reciprocal peer tutoring: A multimodal assessment of effectiveness with college students. **Teaching of Psychology, 16**(3), 133-135.

Fantuzzo, J. W., Riggio, R. E., Connelly, S., & Dimeff, L. A. (1989). Effects of reciprocal peer tutoring on academic achievement and psychological adjustment: A component analysis. **Journal of Educational Psychology. 81**(2), 173-177.

**STRUCTURED CONTROVERSY (SC) [JOHNSON, JOHNSON & SMITH, 1986].** The Johnson's model focuses on the positive influences of planned and structured controversy upon achievement and social relationships. This technique uses four primary steps including:

1) Choose a discussion topic. Primary consideration here is that the topic have at least two well-documented positions.
2) Prepare instructional materials including:
   a. clear description of a group's task
   b. description of the phases of the controversy procedure and the collaborative skills to be used during each phase (see discussion rules below).
   c. definition of the position to be advocated with a summary of the key arguments supporting the position.
   d. provide materials (including a bibliography) that support and elaborate upon the arguments for the position to be advocated.
3) Structure the controversy:
   a. assign students to groups of four
   b. divide each group into two pairs (dyads) who are assigned opposing positions on the topic to be discussed
   c. require each group to reach a consensus on the issue and turn in a group report on which all members will be evaluated.

4) Conduct the controversy.
   a. plan positions.
   b. present positions.
   c. argue the issue
   d. practice perspective reversal
   e. reach a decision

DISCUSSION RULES TO FOLLOW DURING CONTROVERSY:

1. be critical of ideas, not people
2. focus on best decision possible, not on "winning"
3. encourage everyone to participate and master all relevant information.
4. listen to everyone's ideas, even if you do not agree
5. restate what someone has said if it is not clear.
6. consider all ideas and facts supporting both sides, and then try to put them together in a way that makes sense.
7. try to understand both sides of the issue.
8. be prepared to change your mind when the evidence clearly indicates that you should do so.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1986). Academic conflict among students: Controversy and learning. In R. S. Feldman (Ed.), **The social psychology of education: Current research and theory** (pp. 199-231).

**THINK-PAIR-SHARE [Frank Lyman].** This technique is a "multi-mode" strategy developed to encourage student participation in the classroom. Students are taught to use a new response cycle in answering questions. The technique is simple to learn and is applicable across all grade levels, disciplines and group sizes. In some cases (K-12) students can facilitate the process themselves. The components of **Think-pair-share** are as follows:

1. Students **listen** while a teacher poses a question.
2. Students are given time in which to **think** of a response.
3. Students are then cued to **pair** with a neighbor and discuss their responses.
4. Finally, students are invited to **share** their responses with the whole group.

A time limit is set for each step in the process. Many teachers use curing devices such as bells, pointers, hand signals, or cubes to move students through the cycle. Students may be asked to write or diagram their responses while in the think and/or pair mode(s).

**BENEFITS TO STUDENTS.** Students have time to at least think through their own answers to questions before the questions are answered and the discussion moves on. They rehearse responses mentally, and sometimes verbally with another student, before being asked to share publicly. All students have an opportunity to share their thinking with at least one other student, thereby increasing their sense of involvement. Think-Pair-Share is a Cooperative Learning strategy, and as such has advantages for students in the areas of acceptance, peer support, achievement, self-esteem, liking of other students, and liking of school. Cooperative Learning also has positive effects on mainstreaming and relationships between handicapped and nonhandicapped students.

**BENEFITS TO TEACHERS.** Students have been found to spend more time on task and to listen to each other more when engaged in **Think-Pair-Share** activities. Many more students raise their hands to respond after rehearsing in pairs. Students may have better recall due to increased "wait time," and the quality of responses may be better. Like students, teachers also have more time to think when using **Think-Pair-Share.** They can concentrate on asking higher-order questions, observing student reactions, and listening to student responses. Class discussion can be a much more relaxing experience for teachers and students.

Developed by Dr. Frank Lyman, Howard County Public Schools and the Southern Teacher Education Center, University of Maryland.

**ROUNDTABLE [Ellen Stine Miller & Karen Spencer].** Rountable is a technique that can be used for brainstorming, reviewing, or practicing a skill. Used in a contest fashion (inter-group competition), it can also be an excellent teambuilding technique. Roundtable ensures that all members of a group are involved. Roundtable requires groups of 3 or more seated around a common writing surface. Participants need a pencil or pen, and one piece of paper to be shared by the group. The leader should announce the question or problem. Groups should be told that their job is to brainstorm as many answers as they can to the question or problem. They must follow certain rules in answering:

1. Group members must take turns writing answers on the piece of paper, passing the paper around the circle clockwise.
2. Members must not skip a turn. (You may decide if helping is allowed. If participants become stuck too often or too quickly, the problem may have been too hard.)
3. Groups must stop when time is called (about 1 minute, depending on the task).

The key to **Roundtable** is the question or problem. It must be one with multiple answers and one which offers a high probability of success to all participants. You should relate the question to the purpose of the class, but keep it very simple so that all participants can contribute and experience working productively as a group. When time is called, results will be handled according to your objective. If the objective was **teambuilding**, each team should score its own answer sheet and count the number of correct answers. The leader should reward the groups with the most answers and ask them to describe their methods. (Alternatively you can reward the most unusual or creative answers.) If your objective was simple to **brainstorm** a variety of answers, a simultaneous sharing technique such as "Stand and Share" would be appropriate.

**SIMULTANEOUS ROUNDTABLE.** When the answers are long, groups are larger, or production of ideas is more important, send more pieces of paper around at the same time. **Example 1:** Have each participant begin to brainstorm answers to a question. Then have each pass his/her sheet to the left. Participants read and respond to the sheets they receive, then pass them on. Work continues until the papers have been passed completely around the table. **Example 2:** Give each participant in a group a different category for a response. For instance, if working on a school climate plan, categories might be speakers, topics, sources of funds, and incentives for participating. Participants write one idea on their sheet, and then pass them to the left. They will have a new category to respond to as they receive each new sheet. Work continues until the papers have been passed around the group several times.

Ellen Stine Miller & Karen Spencer. Cooperative Structures for Administrators and Supervisors.

**THE GROUP-INVESTIGATION MODEL (G-I) [Sharan, 1980].** The Group-Investigation (G-I) model is conceived as progressing through a sequence of six steps:

1) Selection by group members of specific subtopics within a general problem area usually delineated by the instructor. Group members organize into small (2-6) member task oriented and heterogeneous groups.

2) Cooperative planning by students and instructor of specific learning procedures, tasks, and goals consistent with the subtopics of the problem selected in Step 1.

3) Group members carry out their plan formulated in Step 2. Learning should involve a wide variety of activities and skills, and should lead students to different kinds of sources both inside and outside the school. Instructors closely follow the progess of each group and offer assistance when needed.

4) Pupils analyze and evaluate information obtained during Step 3, and plan how it can be summarized in some interesting fashion for possible display or presentation to the rest of the class.

5. Some or all of the groups in a class then give a presentation of the topics studied in order to get their classroom peers involved in each other's work, and to achieve a broad perspective on the topic. The instructor coordinates the group presentations.

6) Evaluation by classroom peers and instructor of each group's contribution to the work of the class as a whole, in cases where groups pursued different aspects of the same topic. Evaluation can include either individual or group assessment, or both.

Sharan, S. (1980). Cooperative learning in small groups: recent methods and effects on achievement, attitudes, and ethnic relations. **Review of Educational Research**, 50, 241-258.

**THE STUDENT TEAM PROJECT (STP) [Sherman & Woy-Hazleton, 1988].** This is a year-long public service project carried out by small groups (4-6 member teams) of graduate students. It is an integral part of the first year experience of the Institute of Environmental Studies (IES) program and stresses

1) the interdisciplinary nature of environmental problems and their solutions,
2) the importance of team work in problem solving, and
3) the responsibility for professionalism in oral and written presentations.

Groups are assigned to solve a particular problem of a real community institution: eg., city council, a rural electric cooperative, a local recycling agency, etc. The **STP** technique makes use of a problem-solving algorithm based on the thoughts of Lippitt et al's (1958) descriptions of planned change. The 10-stage cycle is as follows:

1) Problem identification
2) Establishing problem boundaries
3) Goal and objective settings
4) Establishing a study design
5) Data collection and analysis
6) Developing alternative solutions
7) Assessmentof alternatives
8) Selection of alternative solution
9) Implementation of solution
10) Ongoing monitoring and evaluation

Sherman, L. W. & Woy-Hazelton, S. (1988). **The student team project: A long-term cooperative strategy in graduate environmental studies.** Paper presentation to the Fourth Convention of the International Association for the Study of Cooperation in Education. Kibbutz Shefayim, Israel, July 5-8, 1988. **ERIC DOCUMENT,** ED 299-872.

**DYADIC ESSAY CONFRONTATIONS (DEC) [Sherman, 1988].** This dyadic technique uses short essay writing experiences which are assigned throughout a semester-long course focused on psychological theories of human development. The content of these essays is based on two sources: 1) a textbook chapter which discusses a specific theory of human development (eg., Piaget), and 2) a primary source reading (eg., an essay by Jean Piaget). At regularly scheduled times each student has to compose an essay question, as well as a brief model of the type of answer which they would find acceptable. Students are instructed that their questions should be comparative in nature and, as the class progresses, earlier material and chapter content (other theories) should be integrated into either the questions or answers. The questions should require some thought and not be trivial in the sense that one could construct an objective multiple choice format with highly convergent answers. Students prepare two sheets to bring to class: one containing both the question as well as their prepared answer, and the other one containing only the question. The later sheets are randomly distributed to the members of the class who are given approximately 25 minutes to write an answer to someone else's question. This is an "open book" essay experience and the textbook and related materials are freely available to the class when they write their essay answers. After writing their answer, they then must confront the person who posed the question, read their answer, and then discuss the points of convergence and divergence among each other. Reciprocal peer evaluations are also incorporated into this experience. On a 0 (poor) to 4 (excellent) scale, students rate each others questions and answers within the frame work of five dimensions including 1) general impressions, 2) importance, 3) clarity, 4) integration , and 5) creativity. The instructor also rates all questions and answers in a similar manner. The sum of all these ratings is computed and then a percentage score (out of 120 total possible points) is computed. This technique is positively accepted by post-graduate students who find it challenging and satisfying. It is based on postmodern thought, higher level thinking processes and the introduction of conceptual conflict, arousal and motivation through integrating the writing process into the psychology curriculum.

I. To be accomplished outside of class.

1. **Text Reading.** Entire class reads the exact same two pieces of literature:

A. A chapter of text focusing on a specific developmental theory: eg, Erik Erikson's Psycho-Social Theory of Personality Development).

B. A primary source "reading" handed out by the instructor: eg., an article written by Erik Erikson.

2. **Question Writing.** Each student writes a question attempting to integrate or link issues which they perceive to be important in both reading assignments.

3. **Answer Writing.** Each student then writes a model answer to their own question - a brief essay which is not more than one page, single-spaced.

4. Before coming to class each student reproduces a single copy of their question (their answer not included).

II. To be accomplished in class.

5. **Question Exchange.** Students exchange copies of their questions with each other.

6. **Writing.** Students spend approximately 25 minutes writing answers to each others' questions.

7. While students are writing answers to each others' questions, the instructor makes copies of all the questions for later distribution to the entire class.

8. **Reading.** Students read each others' answers. The original poser of the question reads a peers' answer while that peer reads the originator's answer. This is not always a reciprocal exchange and therefore usually involves three people: eg., **B** writes an answer to **A's** question and **C** answers **B's** question, therefore **B** must interact with both **A** and **C.**

9. **Confrontation.** Both students then engage in dialogue over convergent and divergent ideas which they have encountered in each others' essays.

10. **Class Discussion.** A general discussion follows the passing out of copies of all the questions (see #7 above) submitted for that day.

11. **Peer Evaluation.** Students evaluate each other's questions and answers on the basis of five attributes: 1) an overall General Impression, 2) Importance, 3) Clarity, 4) Integration, and 5) Creativity. A 5-point scale ranging from 0 (poor) to 4 (excellent) is used to rate each of the five attributes.

12. **Instructor Evaluation.** The instructor then evaluates the question and both answers along the same dimensions as in #11 above. All rating points are summed for a total possible score of 120 (4 possible points for each of the five attributes as rated by the instructor and a peer evaluator).

Sherman, L. W. (1988). **A Pedagogical strategy for teaching human development: Dyadic essay confrontations through writing and discussion.** Paper presentation to the 8th Annual Lilly Conference on College Teaching. Oxford, Ohio, November, 1988. **ERIC DOCUMENT** ED 305-629, and **ERIC DOCUMENT** ED 321-721.

## APPENDIX B
## ANNOTATED BIBLIOGRAPHY OF COOPERATIVE/COLLABORATIVE LEARNING

(GR=GENERAL REFERENCE; CL=COLLABORATIVE; CP=COOPERATIVE; PT=PEER TUTORING)


Abercrombie, M. L. (1974). **Aims and Techniques of Group Teaching.** London: Society for Research into Higher Education Ltd.
**NOTE.** This is a British orientation and focuses on several strategies including syndicate learning, associative group discussions and peer tutoring. Bruffee (985) recommends Abercrombie's work especially because of his work with "Collaborative Learning" with University of London medical students. **[CL]**

Aronson, E., Blaney, N., Stephan, C. Sikes, J, & Snapp, M. (1978). **The jigsaw classroom.** Beverly Hills, CA: Sage Publications.
**NOTE.** Basic volume on the "Jigsaw" technique, in which topics are divided into segments so each team member learns and teaches a specific component. **[CP,PT]**

Astin, A. W. (1987). Competition or cooperation? Teaching teamwork as a basic skill. **Change, 19**(5), 12-19. **[GR]**

Bar-Tal, D., & Saxe, L. (eds). (1978). **Social Psychology of Education: Theory and Research.** New York: John Wiley & Sons.
**NOTE.** An excellent source of articles linking social psychology and education. Several articles discuss cooperative learning strategies in the classroom. **[GR]**

Billson, J. M. (1986). The college classroom as a small group: Some implications for teaching and learning. **Teaching Sociology,** 14, 143-151.
**NOTE.** Effective Collaborative Learning in the college classroom is discussed with regard to 15 principles. A practical presentation of group development and related processes are brought to bare on classroom implementation of collaborative learning. **[CL]**

Bishop, W. (1988). Helping peer writing groups succeed. **Teaching English in the Two Year College,** 15, 120-125.
**NOTE.** This paper focuses on collaborative learning, especially in writing groups. It presents several issues which should be considered when attempting to set up a peer writing groups in college composition classes. **[CL]**

Bohlmeyer, E. M., & Burke, J. J. (1987). Selecting cooperative learning techniques: A consultative strategy guide. **School Psychology Review,** 16, 36-49. **[CP]**

Borresen, C. R. (1990). Success in introductory statistics with small groups. **College Teaching 38**(1), 26-28. **[CP]**

Bossert, S. T. (1988). Cooperative activities in the classroom. **Review of Research in Education, 15**, 225-252.

Bouton, C. & Garth, R. (Eds.). (1983). **Learning in groups.** San Francisco: Jossey-Bass.
**NOTE.** Several authors discuss research and practice in "Collaborative Learning." This article provides a general review of collaborative learning in many different college disciplines. **[CL]**

Bruffee, K. A. (1985). **A Short course in writing.** Boston: Little, Brown.
**NOTE.** Collaborative learning in college writing classes is detailed. Faculty involved in teaching writing as well as other disciplines which use writing would be strongly interested in this short text. **[CL]**

Collier, G. (Ed.). (1983). **The management of peer-group learning: Syndicate methods in higher education.** Guildford, Surrey: Society for Research into Higher Education Ltd.
**NOTE.** The British approach to peer-group learning is presented by diverse authors from post-secondary institutions. **[CP,CL]**

Cooper, J.L. (1990). Cooperative learning and college teaching: Tips from the trenches. **The Teaching Professor, 5**(5), 1-2. **[GR]**

Cooper, J. L., & Mueck, R. (1989). Cooperative/collaborative learning: Research and practice (primarily) at the collegiate level. **The Journal of Staff, Program, and Organization Development,** 7(3), 149-151. **[GR]**

Cooper, J. L., & Mueck, R. 1990. Student involvement in learning: Cooperative learning and college instruction. **Journal of Excellence in College Teaching, 1,** 68-76.

Cooper, J. L., Sanchez, P., Prescott, S., & Lawrence, T. (1988) **Cooperative learning and college instruction: Part II.** A paper presentation to the Western Psychological Association, San Francisco, CA. April, 1988.
**NOTE.** This paper describes characteristics of Cooperative Learning, positive outcomes of these techniques and 3 applications by professors in different disciplines. Student evaluations of the techniques are discussed with regard to their effectiveness, demonstrating that they perceived improved higher level thinking skills, general academic achievement and quality and frequency of student/student interactions. **[CP]**

Cooper, J. L., Prescott, S. Cook, L., & Cuseo, J. (1990). **Cooperative Learning and College Instruction: Effective Use of Student Learning Teams.** Long Beach - 400 Golden Shore - California, 90802-4275. Institute for Teaching and Learning ($14.00).
**NOTE.** This handbook shows a case for using cooperative pegagogics at the college level, their critical features, how to organize the cooperative classroom, how to get started, how to integrate cooperative strategies into existing teaching styles (lectures, discussions, group & laboratory projects), typical concerns of college teachers considering the use of cooperative learning. In general, cooperative learn is presented as an example of effective educational principles applied to classroom teaching in the higher educational setting. The first author, James Cooper, also maintains an excellent annotated bibliography of cooperative/Collaborative Learning. It is available from him at the following address: School of Education, California State University Dominquez Hills, 1000 East Victoria Street, Carson, CA 90747. **[GR]**

Dansereau, D. F. (1987). Transfer from cooperative to individual studying. **Journal of Reading,** April, 1987, 614-618.
**NOTE.** This article contains a good description of Dansereau's (an associates) scripted cooperative dyad technique for learning complex textbook materials. While these techniques have been used primarily with undergraduate general psychology students, they have also been found effective with engineering students learning technical materials. **[PT]**

Davidson, N. (1990). The small-group discovery method in secondary and college-level mathematics. In N. Davidson (Ed.), **Cooperative learning in mathematics: A handbook for teachers** (pp. 335-361). Menlo Park, CA: Addison-Wesley. **[CP]**

DiPardo, A., Warshauer-Freedman, S. (1988). Peer response groups in the writing classroom: Theoretic foundations and new directions. **Review of Educational Research, 58,** 119-149.
**NOTE.** This article recommends the moving away from teacher-controlled response groups to student-centered peer talk during the writing process. It reviews the pedagogical literature on response groups, and places the literature in the context of current theories of teaching and learning or writing, and then examine the small number of studies of peer response groups. **[CL]**

Fantuzzo, J. W., Dimeff, L. A., & Fox, S. L. (1989). Reciprocal peer tutoring: A multimodal assessment of effectiveness with college students. **Teaching of Psychology, 16**(3), 133-135.

Fantuzzo, J. W., Riggio, R. E., Connelly, S., & Dimeff, L. A. (1989). Effects of reciprocal peer tutoring on academic achievement and psychological adjustment: A component analysis. **Journal of Educational Psychology. 81**(2), 173-177.
**NOTE.** Both of the above articles assess the effects of a technique described as "reciprocal peer tutoring"(**RPT**) on the academic performance of college students. Comparative measures of the impact of this procedure on levels of student distress and course satisfaction are made. Results indicate greater achievement, reduction in distress, and greater student satisfaction found in the **RPT** condition than in two other comparison conditions. **[PT]**

Feichtner, S. B., & Davis, E. A. (1984-5). Why some groups fail: A survey of students' experiences with learning groups. **The Organizational Behavior Teaching Review,** 9(4), 58-71.
**NOTE.** A practical description of good and bad collaborative learning procedures in college instruction. **[CL]**

Feichtner, S. B., & Michaelsen, L. K. (1984). Giving students a part in the process: An innovative approach to team learning. **College Student Journal, 18,** 335-344.
**NOTE.** Team learning in heterogeneous groups is described.**[CL,CP]**

Feldman, R. S. (Ed.). (1986). **The social psychology of education: Current research and theory.** Cambridge: Cambridge University Press.
**NOTE.** An excellent selection of articles relating social psychology and its applications to educational settings. **[GR]**

Gere, A. R. (1987). **Writing groups: History, theory and implications.** Carbondale: Southern Illinois University Press.
**NOTE.** Theories of collaborative learning and language development are presented. Piagetian and Vygotskian approaches to language acquisition and cognitive development are a primary focus of this short book which details the importance of Vygotsky to the Collaborative/Cooperative Learning field. Super good annotated bibliography included. **[CL]**

Glidden, J., & Kurfiss, J. G. (1990). Small-group discussion in Philosophy 101. **College Teaching, 38**(1), 3-8.

Graves, N., & Graves, T. (Executive Editors), (1990). **Cooperative Learning: The Magazine for Cooperation in Education.** Volume 11, No. 1, September, 1990.
**NOTE.** This magazine is the official organ of the **International Association For The Study of Cooperation In Education (IASCE).** This issue is entitled, "Cooperative Learning: A Resource Guide," and contains one of the most up-to-date (as of September, 1990) descriptions of books and related documents associated with the implementation of cooperative learning. While most of the materials address settings other than higher education, there are two pages worth of annotated materials relevant to college classroom teaching. Many of the materials, especially the descriptions of books about "General Introductions to Cooperative Learning" and other "Collected Readings In Cooperative Learning" are excellent resources for those interested college teaching. This issue is available from Nan and Ted Graves, Box 1582, Santa Cruz, CA 95061-1582. **[GR]**

Hanson, P. G. (1981). **Learning through groups: A trainer's basic guide.** San Diego, CA: University Associates.
**NOTE.** Group learning techniques from the human relations trainer perspective are reviewed. **[GR,CP,CL]**

Hassard, J. (1990). **Science experiences: Cooperative learning and the teaching of science.** Menlo Park, CA: Addison-Wesley. **[CP]**

Hawkins, T. (1976). **Group inquiry techniques for teaching writing.** Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills and National Council of Teachers of English. **ERIC DOCUMENT ED 128-813.**
**NOTE.** A team learning strategy for teaching college writing is described in the practically oriented monograph. **[CL]**

Johnson, D. W., & Johnson, R. T. **Learning together and alone: Cooperative, competitive, and individualistic learning (2nd ed.).** Englewood Cliffs, New Jersey: Prentice-Hall.
**NOTE.** Systematic methods for using cooperative, competitive, and individualistic learning are discussed. **[GR,CP]**

Johnson, D. W., & Johnson, F. P. (1987). **Joining together: Group theory and group skills (Third edition).** Englewood Cliffs, NJ: Prentice-Hall, Inc.
**NOTE.** An excellent source documenting the association between Cooperative Learning and the **Group Dynamics** movement. Each chapter provides a multitude of experiential activities. Traditional group dynamics topics including leadership, group decision making, group goals and goal structures, communication, conflict, cohesion, power, etc. are discussed especialy within the framework of teams and cooperative learning. **[GR,CP]**

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1986). Academic conflict among students: Controversy and learning. In R. S. Feldman (Ed.), **The social psychology of education: Current research and theory** (pp. 199-231). Cambridge: Cambridge University Press.
**NOTE.** A technique called "structured controversy" is described as having different members of the same learning team assume different positions concerning an issue in an attempt to ultimately maximize learning for all team members through discussion and research relating to the differing positions. The Johnson's suggest that their technique sparks conceptual conflict within students, creates epistemological curiosity and promotes higher-level thinking. **[CP]**

Johnson, R. T., Johnson, D. W., & Smith, K. A. (1988). **Cooperative learning: An active learning strategy for the college classroom.** Unpublished manuscript. University of Minnesota. Available from authors.
**NOTE.** Several cooperative learning strategies which may be used in college settings are briefly described. An excellent discussion of problems with traditional lecture (frontal) presentation are described. **[GR,CP]**

Kagan, S. (1989). **Cooperative learning: Resources for Teachers.** Riverside, CA: University of California. 300 pp.
**NOTE.** An idea/resource manual on team learning, jigsaw, and Co-op Co-op, Kagan's own variation on the "Group Investigation" model. **[GR,CP]**

Kohn, A. (1986). **No contest: The case against competition.** New York: Houghton Mifflin.
**NOTE.** An excellent source for the many arguments in favor of cooperative pedagogy. While written in a journalistic style, it draws on much of the empirical literature to justify the implementation of cooperation teaching practices. **[GR]**

Larson, C. O., & Dansereau, D. F. (1986). Cooperative learning in dyads. **Journal of Reading, 29(6)**, 516-520.
**NOTE.** This article provides a brief review of cooperative learning and goes on to describe in detail the **Scripted Cooperative Dyadic** approach primarily associated with Donald Dansereau. See Dansereau (1987) above, as well. **[PT]**

Lippitt, R., Watson, J., & Westley, B. (1958). **The dynamics of planned change: A comparative study of principles and techniques.** New York: Harcourt & Brace.
**NOTE.** Chapters 5 & 6 of this book detail the multi-step team problem solving process of social engineering which is grounded in social science. This is the model upon which Sherman & Hazleton's (1988) Student Team Project paper is based. **[CP]**

Millis, B. J. (1990). Helping faculty build learning communities through cooperative groups. In L. Hilsen (ed.), **To improve the academy: Resources for student faculty, and institutional development, 10**, 43-58. Stillwater, OK: New Forums Press. **[CP]**

Michaelsen, L., Watson, W. E., & Sharder, C. B. (1984-5). Informative testing -- a practical approach for tutoring with groups. **The organizational Behavior Teaching Review, 9**(4), 18-33.
**NOTE.** Using a mastery approach to evaluation (criterion-referenced testing), the authors describe a collaborative learning strategy based on organizational behavior which is designed to diagnose and remediate students' learning. **[CL]**

Nastasi, B. K., & Cleme, Duglas H. (1991) Research on cooperative learning: Implications for practice. **School Psychology Review, 20**(1), 110-131.
**Note.** This article provides an overiew of research on cooperative learning with an emphasis on issues related to the implementation of cooperative learning groups. Specific benefits of cooperative learning for cognitive development, academic achievement, and social-emotional growth are reviewed, and a theoretical rationale for exlaining such benefits is presented. Types of groups and benefits of each are described. Specific questions relevant to the formation and implementation of cooprative learning groups are answered on the basis of research. Finally, a model for implementation is described which emphasizes the enhancement of higher-order thinking, effectance motivation, and social skills.

Radebaugh, M. R & Kazemek, F. E. (1989). Cooperative learning in college reading and study skills classes. **Journal of Reading, 32**, 414-418.
**NOTE.** The use of Cooperative learning in college study skills classes is described. Special attention to literacy as a social construct is the primary focus of this article. It is suggested that this technique may be useful in many other academic disciplines and courses. **[CP,PT]**

Romer, K. T. (1985). Collaboration: New forms of learning, new ways of thinking. **The Form for Liberal Education. 8(2),** pp. 3-19.
**NOTE.** This article is a compendium collaborative models presently being used at colleges and universities throughout the United States including Alverno College, CUNY-Queens College, Universityof Delaware, Depauw University, Dickinson College, University of Minnesota at Morris, Pace University, SUNY-Stony Brook, Tufts University and Washington and Lee University. Excellent brief descriptions of the various models are provided along with a very comprehensive annotated bibliography. **[CL]**

Schmuck, R. A., & Schmuck,P. A. (1988). **Group Processes in The Classroom (5th edition).** Dubuque, Iowa: Wm. C. Brown.
**NOTE.** A good over all source on group dynamics. Most cooperative learning strategies are discussed at some point throughout their book. It is oriented more toward elemenatary and secondary public schools. Nevertheless, it is well documented and grounded in the group dynamics movement. The Schmucks were students of Ronald Lippitt. **[GR]**

Sharan, S. & Sharan Y. (1976). **Small Group Teaching.** Englewood Cliffs, NJ: Educational Technology Publication. 256 pp.
**NOTE.** One of the early and seminal publications in the field of cooperative pedagogy. It's focus is on the Group Investigation Model which these two Israeli's have constructed. **[CP]**

Sherman, L. W. (1976). Formative evaluation, mastery grading, and peer directed small group discussions in an introductory educational psychology class. In J. B. Maas & D. A. Kleiber (eds), **Directory of Teaching Innovations In Psychology.** Washington, DC: American Psychological Association, pp. 445-446.
**NOTE.** Describes a small group instructional procedure used in large lecture sections of an introductory educational psychology class. **[CP]**

Sherman, L. W. (1988). **A pedagogical strategy for teaching human development: Dyadic essay confrontations through writing and discussion.** A paper presentation to the 8th annual Lilly Conference on College Teaching, November 5-6, 1988. Oxford, OH: Miami University. **ERIC DOCUMENT ED 305-629 and ERIC DOCUMENT ED 321-721.**
**NOTE.** These papers describe a Cooperative Learning technique based on writing, discussion/confrontation, and resolution of ideas related to human development classes. **[PT, CL, CP]**

Sherman, L. W., & Woy-Hazleton, S. (1988). **The student Team Project: A long-term cooperatively structured pedagogy for graduate environmental studies.** A paper presentation to the 4th Conference on Cooperation in Education. Tel Aviv, Israel, July 5, 1988. **ERIC DOCUMENT ED 299-872.**
**NOTE.** Describes a 10 step algorithm for team environmental problem-solving which is based on Lippitt's (1958) model. Primarily used in an Interdisciplinary Graduate program in Environmental Studies. **[CP]**

Slavin, R., Sharan, S., Kagan, S. Hertz-Lazarowitz, R. Webb, C., & Schmuck, R. (Eds.). (1985). **Learning to cooperate, cooperating to learn.** New York: Plenum Press.
**NOTE.** One of the best introductions to the area of cooperative pedagogy. While its focus is primarily on elementary and secondary education levels, the explanations of a variety of methods have relevance for post secondary education, as well. Five sections of the book cover 1) basic concepts, 2) Internal dynamics of cooperative learning, 3) cooperative learning in mathematics and science, 4) cooperative learning and the multi-ethnic classroom, and 5) Learning to cooperate. **[GR]**

Smith, K. A. (1984). Structured controversies. **Engineering Education,** 74, 306-309.
**NOTE.** The Johnson's et al.1986) structured controversy approach to cooperative learning is outlined with in the context of a college engineering course. **[CP]**

Smith, K. A., Johnson, D. W., & Johnson, R. T. (1981). Structuring learning goals to meet the goals of engineering education. **Engineering Education, 72**, 221-226.
**NOTE.** Cooperative learning strategies in collegiate engineering courses are discussed. Generalizations to other disciplines are made. **[CP]**

Weinstein, C. S. (1991). The classroom as a social context for learning. **Annual Review of Psychology, 42**, 493-525.
**NOTE.** This review presents an ecological psychology discussion of several classroom "activity settings," of which cooperative learning is highlighted. The influence of the cooperative learning behavior setting on the social hierarchy of classrooms is emphasized. **[GR]**

Wiener, H. S. (1986). Collaborative learning in the classroom: A guide to evaluation. **College English**, 48, 52-61.
**NOTE.** The role of the instructor in establishing collaborative learning in college courses is discussed. **[CL]**

Whipple, W. (1987). Collaborative learning: Recognizing it when we see it. **American Association for Higher Education, 40**(2), 3-7.
**NOTE.** The author is the chair of the Collaborative Learning Action Community (CUE) of the AAHE. This paper reviews characteristics of Collaborative Learning. **[CL]**

Whitman, N. E. (1988). **Peer teaching: To teach is to learn twice.** ASHE-ERIC Higher Education Report No. 4. Washington, DC: Association for the Study of Higher Education. **[PT]**

**Educational Leadership. (1987).** Brandt, R. S., Executive Editor. Journal of the Association for Supervision and Curriculum Development. Volume 45, No. 3., November, 1987, pp. 4-75.

**Educational Leadership**, (1989).Slavin, R. E., Guest Editor. Journal of the Association for Supervision and Curriculum Development. Volume 47, No. 4 (December 1989/January, 1990), pp. 4-66.
**NOTE.** Both of the above journal issues contain a special focus on cooperative learning. Several authors from around the world present the latest views with regard to cooperative pedagogy as applied at elementary secondary and post-secondary levels of education. Highly recommend for anyone interested in the contemporary uses of Cooperative Learning at any level of education. **[GR,CP,CL,PT]**